WM-31/31SS/41

SERVICE MANUAL

Refer to SRS-3 Service Manual issued previously for information of speaker system supplied with WM-31SS.

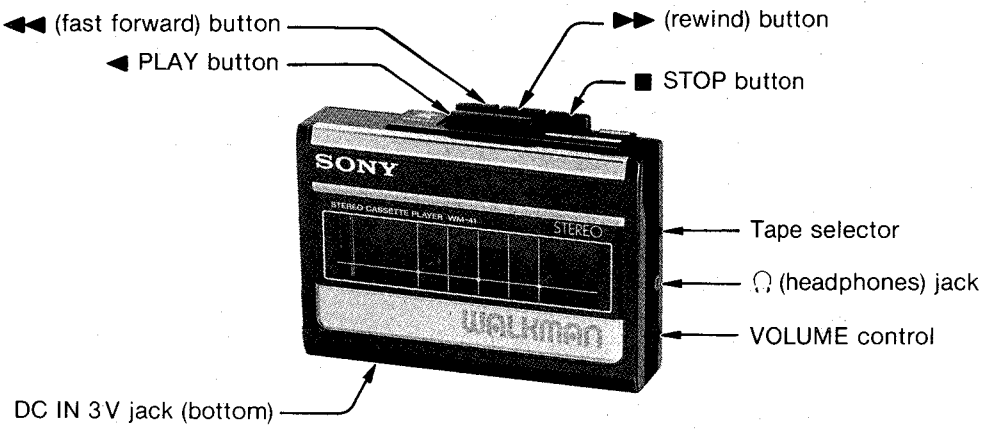


PHOTO: WM-41

WM-31:
G-AEP Model
E Model
WM-31SS:
UK Model
AEP Model
WM-41:
US Model
Canadian Model

SPECIFICATIONS

Similar Mechanism Set	WM-33/43

Tape track	4-track 2-channel stereo
Fast winding time	Approx. 3 min. 20 sec. with Sony C-60 cassette
Frequency response	40–14,000 Hz (with the tape selector set to CrO_2/METAL) 40–14,000 Hz (with the tape selector set to NORMAL)
Power output	15 mW + 15 mW at DC operation (at 10% harmonic distortion) load impedance 32 ohms
Power requirements	3 V DC, two size AA (IEC designation R6) batteries External batteries (used in the optional EBP-500 battery case): two size D (IEC designation R20) batteries DC IN 3 V jack accepts: Sony AC-D2 AC power adaptor (optional) Sony DCC-70 car battery cord (optional)

Battery life

Batteries	Continuous playback hours
Sony SUM-3(NS) New Super or Eveready No. 1015 Heavy Duty batteries	Approx. 4
Sony Eveready AM3 alkaline or Eveready No. E91 alkaline batteries	Approx. 8

For maximum performance we recommend the use of alkaline batteries.

Dimensions	Approx. 120 × 88.1 × 33.5 mm (w/h/d) ($4\frac{3}{4} \times 3\frac{1}{2} \times 1\frac{3}{8}$ inches) not incl. projecting parts and controls
Weight	Approx. 195 g (6.9 oz) incl. batteries, not incl. other accessories

MICROFILM

STEREO CASSETTE PLAYER

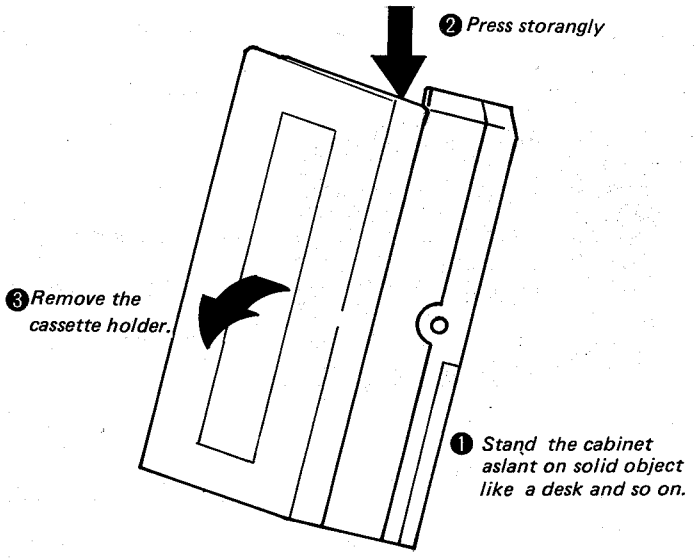
SONY®

TC

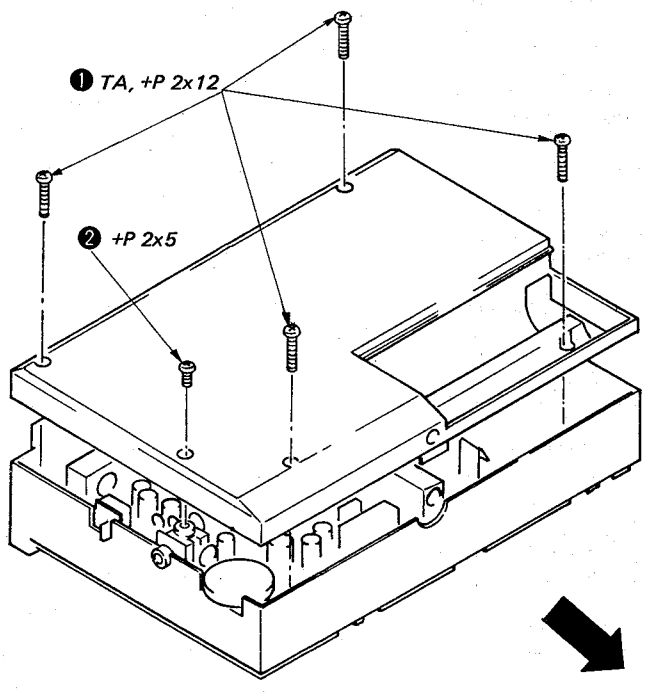
SECTION 1
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

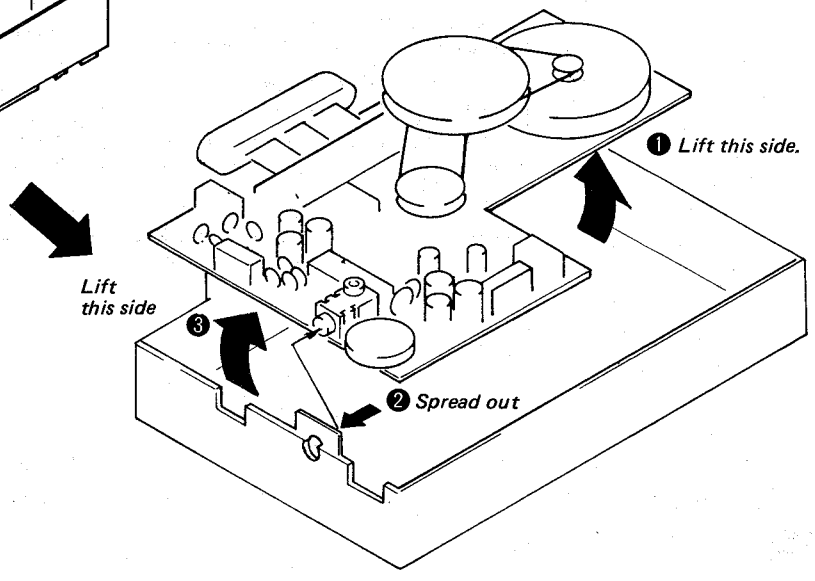
CASSETTE HOLDER REMOVAL



CABINET (REAR) REMOVAL



MAIN BOARD & TRANSPORT MECHANISM REMOVAL



SECTION 2
ADJUSTMENTS

2-1. MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:
   playback head — pinch roller
   capstan — idlers
   rubber belts
2. Demagnetize the playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Torque Measurement

Torque	Meter Reading	Torque Meter
Forward	22-36g•cm (0.3-0.5 oz•inch)	CQ-102C
Fast Forward and Rewind	55-150g•cm (0.77-2.1 oz•inch)	CQ-201B
Back Tension	0.5-2g•cm (0.007-0.028 oz•inch)	CQ-102C

Tape Tension Measurement

Meter	Meter Reading
CQ-403A	more than 100g (3.57 oz)

2-2. ELECTRICAL ADJUSTMENTS

CASSETTE Section

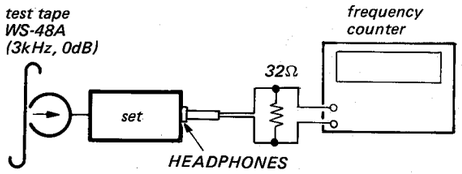
Tape Speed Adjustment

Setting:

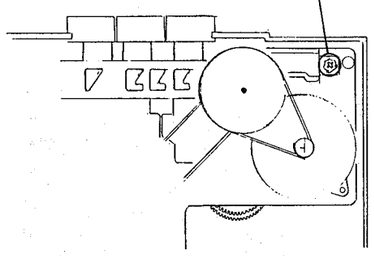
VOL control: mechanical mid

Procedure:

Mode: playback



Adjustment Location: main board



Specifications:

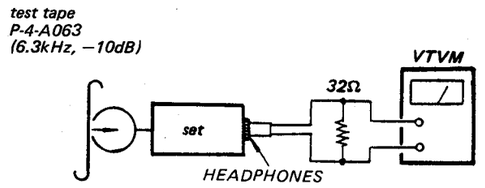
Digital frequency counter
2,990 – 3,010 Hz

Frequency difference between beginning and end of tape should be within ± 1% (30 Hz).

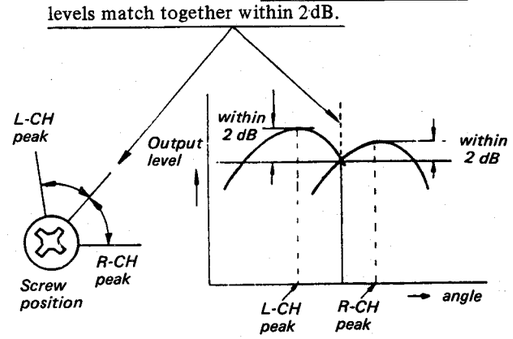
Playback Head Azimuth Adjustment

Procedure:

1. Mode: playback

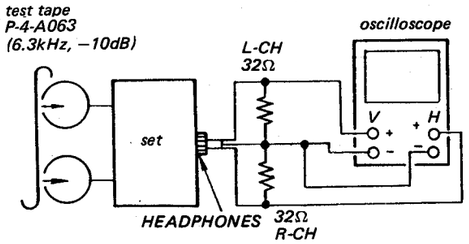


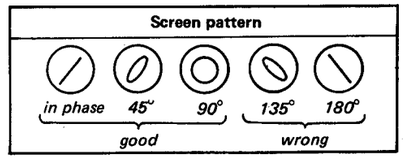
2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 2dB.



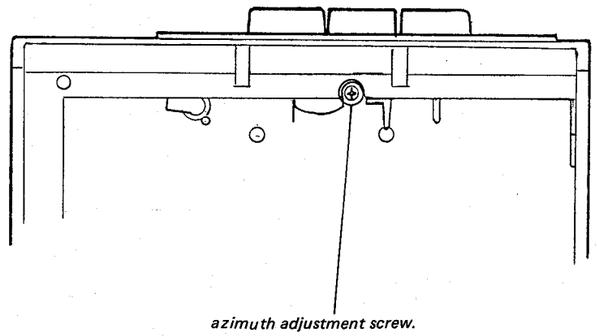
3. Phase Check

Mode: playback





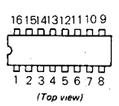
Adjustment Location:



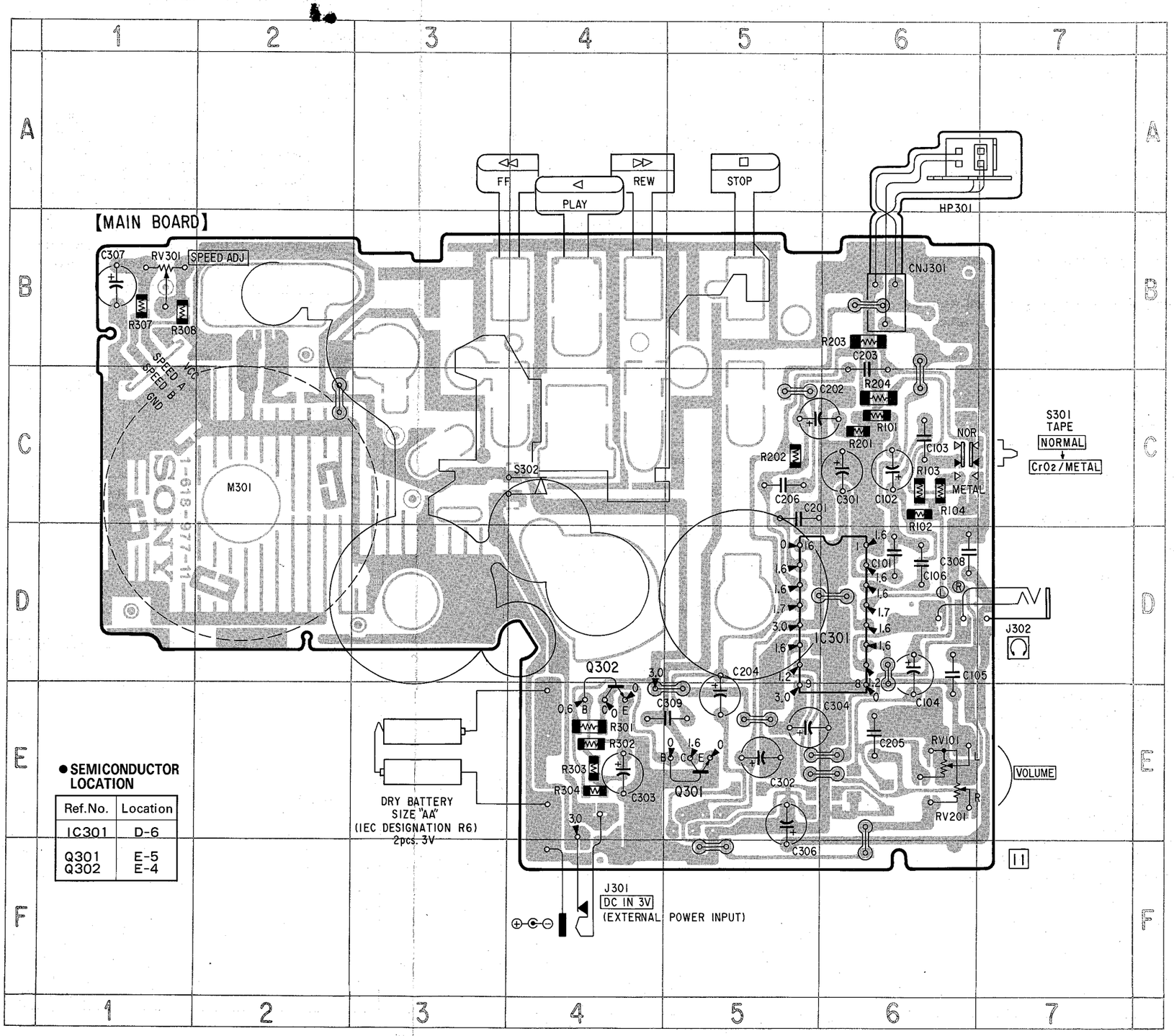
SECTION 3
DIAGRAMS

- ○—— : parts extracted from the component side.

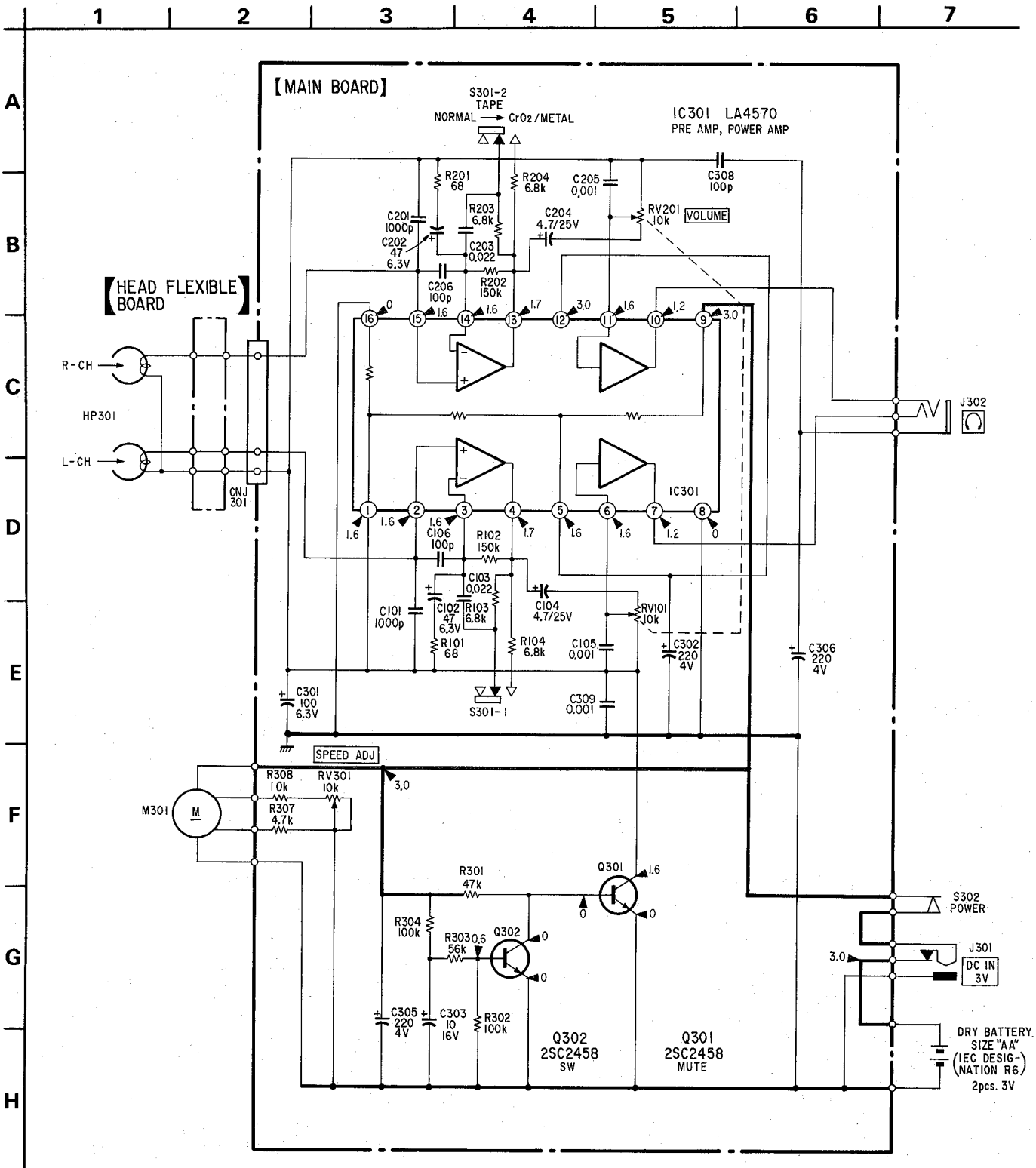
- **Semiconductor Lead Layouts**

IC301	2SC2603F
	

3-1. MOUNTING DIAGRAM



3-2. SCHEMATIC DIAGRAM



Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $^1/_{64}$W.
- All resistors in this set are "PRINTING RESISTOR". When repairing, replace "PRINTING RESISTOR" with conventional "CARBON RESISTOR". Refer to the electrical parts list.

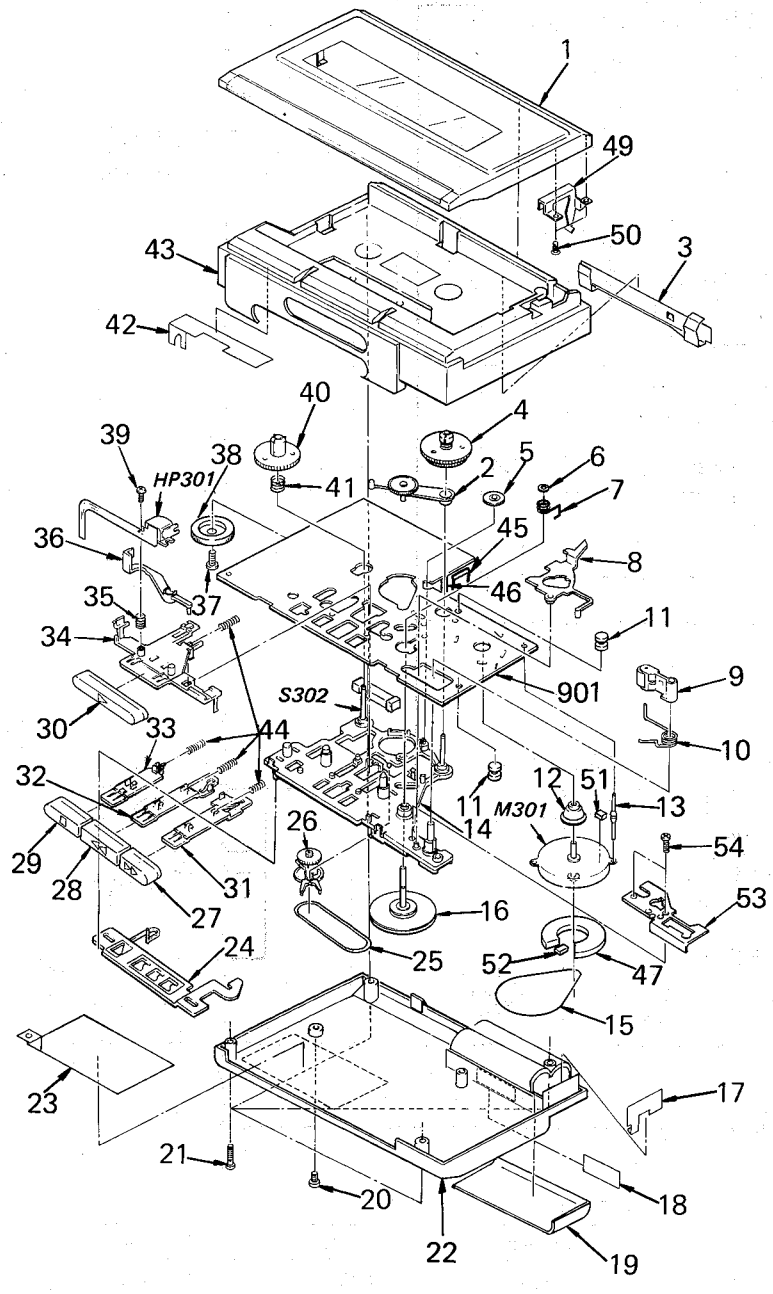
- Switch

Ref. No.	Switch	Position
S301	TAPE	NORMAL
S302	POWER	OFF

- ▬▬ : B+ bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under with a VOM (50 kΩ/V).
- Voltage variations may be noted due to normal production tolerances.

SECTION 4
EXPLODED VIEW

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The construction parts of an assembled part are indicated with a collation number in the remark column.



No.	Part No.	Description	Remarks
1	3-334-065-01	(BLACK)....HOLDER (TC), CASSETTE	
	3-334-065-11	(SILVER)...HOLDER (TC), CASSETTE	
	3-334-065-21	(RED).....HOLDER (TC), CASSETTE	
	3-334-065-31	(BLUE).....HOLDER (TC), CASSETTE	
2	X-3334-007-1	GEAR ASSY, PLAY	
3	3-334-058-01	SPRING, CASSETTE	
4	X-3334-006-1	TABLE ASSY, REEL, TAKE-UP	
5	3-334-089-01	GEAR, FF	
6	3-335-666-01	RING, RETAINING	
7	3-336-705-01	SPRING, GROUND	
8	3-335-613-01	LEVER (A), SHUT-OFF	
9	X-3334-005-1	PINCH ROLLER ASSY	
10	3-335-608-01	SPRING PINCH ROLLER	
11	3-335-652-00	MOTOR, CUSHION (C)	
12	3-335-653-00	MOTOR, CUSHION	
13	3-334-942-00	MOTOR, CUSHION (B)	
14	X-3334-619-1	BASE, GUIDE ASSY	
15	3-335-603-01	BELT, CAPSTAN	
16	X-3334-027-1	FLYWHEEL ASSY	
17	3-334-057-01	TERMINAL BOARD, RELAY	
18	3-330-644-01	(WM-31/31SS/41:Canadian) ...LABEL, SERIAL NUMBER	
	3-701-999-02	(WM-41:US)....LABEL, SERIAL NUMBER	
19	3-334-063-01	(BLACK)....LID, BATTERY CASE	
	3-334-063-11	(SILVER)...LID, BATTERY CASE	
	3-334-063-21	(RED).....LID, BATTERY CASE	
	3-334-063-31	(BLUE).....LID, BATTERY CASE	
20	3-335-641-01	SCREW (M2)	
21	3-335-640-01	SCREW (M2) TP	
22	X-3334-034-1	(WM-31SS/41:BLACK).... CABINET (REAR) SUB ASSY (TC)	
	X-3334-011-1	(WM-31:BLACK)....CABINET (REAR) (TC) ASSY	
	X-3334-012-1	(WM-31:SILVER)...CABINET (REAR) (TC) ASSY	
	X-3334-013-1	(WM-31:RED).....CABINET (REAR) (TC) ASSY	
	X-3334-014-1	(WM-31:BLUE).....CABINET (REAR) (TC) ASSY	
23	3-335-638-01	PAPER (TC), SHIELD	
24	*3-335-618-01	PLATE, LOCK, BUTTON	
25	3-335-604-01	BELT, MIDWAY	
26	X-3334-008-1	GEAR ASSY, MIDWAY	
27	3-334-059-01	BUTTON, FF	
28	3-334-060-01	BUTTON, REW	
29	3-334-061-01	BUTTON, STOP	
30	3-334-062-01	BUTTON, PLAY	
31	3-335-611-01	LEVER, FF	
32	3-335-610-01	LEVER, REW	
33	3-335-609-01	LEVER, STOP	
34	3-334-080-01	CHASSIS, HEAD	
35	3-334-078-01	SPRING (AZIMUTH), COMPRESSION	
36	3-334-079-01	LEVER (B), SHUT-OFF	
37	3-703-502-41	SCREW PTPWH + 1.4X3.5 (TYPE 1)	
38	3-334-056-01	KNOB (TC), VOLUME	
39	3-336-706-01	SCREW,(1T3-C) TAPPING	
40	3-335-612-01	GEAR, SUPPLY REEL	
41	3-335-602-01	SPRING, COMPRESSION	
42	3-335-637-01	PAPER, SHIELD, HEAD	
43	3-334-066-01	(WM-31/31SS).....CABINET (TC)	
	3-334-066-21	(WM-41:US).....CABINET (TC)	
	3-334-066-31	(WM-41:Canadian)...CABINET (TC)	
44	3-335-605-01	SPRING, COMPRESSION	
45	3-334-055-01	TERMINAL BOARD, MINUS	
46	3-334-054-01	TERMINAL BOARD, PLUS	
47	3-335-681-11	SHEET, MOTOR	
49	3-335-661-01	STOPRER, HOLDER	
50	3-318-382-01	SCREW, 1.7X3 TAPPING	
51	3-534-598-01	CUSHION	
52	3-334-971-01	SPACER, MOTOR	
53	3-335-667-01	SPACER, GUIDE	
54	3-894-748-01	SCREW,B 1.4X2.5 TAPPING	
901	*A-3015-430-A	PC BOARD ASSY, MAIN	
HP301	1-543-339-11	HEAD MAGNETIC (PLAYBACK)	
M301	1-541-334-21	MOTOR (NBL-22)	
S302	1-570-549-11	SWITCH, LEAF (POWER)	

SECTION 5
ELECTRICAL PARTS LIST

NOTE:
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC, UPD...: μPD...

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
901	*A-3015-430-A	PC BOARD ASSY, MAIN			
C101	1-161-039-00	CERAMIC	0.001MF	10%	25V
C102	1-123-647-00	ELECT	47MF	20%	6.3V
C103	1-161-055-00	CERAMIC	0.022MF	10%	25V
C104	1-123-616-00	ELECT	4.7MF	20%	25V
C105	1-102-074-00	CERAMIC	0.001MF	10%	50V
C106	1-102-973-00	CERAMIC	100PF	5%	50V
C201	1-161-039-00	CERAMIC	0.001MF	10%	25V
C202	1-123-647-00	ELECT	47MF	20%	6.3V
C203	1-161-055-00	CERAMIC	0.022MF	10%	25V
C204	1-123-616-00	ELECT	4.7MF	20%	25V
C205	1-102-074-00	CERAMIC	0.001MF	10%	50V
C206	1-102-973-00	CERAMIC	100PF	5%	50V
C301	1-123-661-00	ELECT	100MF	20%	6.3V
C302	1-123-827-00	ELECT	220MF	20%	4V
C303	1-123-617-00	ELECT	10MF	20%	16V
C304	1-123-827-00	ELECT	220MF	20%	4V
C306	1-123-827-00	ELECT	220MF	20%	4V
C307	1-123-612-00	ELECT	2.2MF	20%	50V
C308	1-102-973-00	CERAMIC	100PF	5%	50V
C309	1-102-074-00	CERAMIC	0.001MF	10%	50V
CNJ301	*1-563-350-11	CONNECTOR, F.P.C 3P (HEAD)			
HP301	1-543-339-11	HEAD, MAGNETIC (PLAYBACK)			
IC301	8-759-802-85	IC LA4570			
J301	1-507-723-00	JACK, EXTENTION POWER			
J302	1-563-316-11	JACK (HEADPHONES)			
M301	1-541-334-21	MOTOR (NBL-22)			
Q301	8-729-606-33	TRANSISTOR 2SC2603F			
Q302	8-729-606-33	TRANSISTOR 2SC2603F			

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R101	1-247-803-00	CARBON	68	5%	1/6W
R102	1-247-883-00	CARBON	150	5%	1/6W
R103	1-247-851-00	CARBON	6.8K	5%	1/6W
R104	1-247-851-00	CARBON	6.8K	5%	1/6W
R201	1-247-803-00	CARBON	68	5%	1/6W
R202	1-247-883-00	CARBON	150	5%	1/6W
R203	1-247-851-00	CARBON	6.8K	5%	1/6W
R204	1-247-851-00	CARBON	6.8K	5%	1/6W
R301	1-247-871-00	CARBON	47K	5%	1/6W
R302	1-247-879-00	CARBON	100K	5%	1/6W
R303	1-247-873-00	CARBON	56K	5%	1/6W
R304	1-247-879-00	CARBON	100K	5%	1/6W
R307	1-247-847-00	CARBON	4.7K	5%	1/6W
R308	1-247-855-00	CARBON	10K	5%	1/6W
RV101	1-230-485-11	RES, VAR, CARBON 10K/10K			
RV201	1-230-485-11	RES, VAR, CARBON 10K/10K			
RV301	1-230-881-11	RES, ADJ, CARBON 10K			
S301	1-570-659-11	SWITCH, SLIDE(TAPE NORMAL/METAL)			
S302	1-570-549-11	SWITCH, LEAF (POWER)			

ACCESSORY & PACKING MATERIAL

Part No.	Description
3-330-644-01	LABEL, SERIAL NUMBER (PRINTER)
3-527-213-00	LABEL, SERIAL NUMBER
3-765-280-21	MANUAL, INSTRUCTION
3-765-280-71	MANUAL, INSTRUCTION (G-AEP ONLY)
3-795-748-21	SAFETY INSTRUCTIONS, HEADPHONE
8-952-257-90	HEADPHONE MDR-01L/K SET
X-3334-010-1	CASE ASSY, CARRYING

Note:
- All resistors in this set are "PRINTING RESISTOR". When repairing, replace "PRINTING RESISTOR" with conventional "CARBON RESISTOR". Refer to the electrical parts list.